

WHAT IS CLAIMED IS:

1. A linear oscillator comprising:
a moving part reciprocating;
a case containing incorporating said moving part; and
an amplitude control spindle supported in said case to be movable,
wherein said moving part and said amplitude control spindle reciprocate at a resonance frequency of said linear oscillator or a frequency in a vicinity thereof.
2. The linear oscillator according to Claim 1, comprising:
an electromagnetic driving part housed in said case, for reciprocating said moving part; and
a spring member disposed at least between said case and said moving part, and between said case and said amplitude control spindle, for forming a spring oscillation system.
wherein a resonance frequency of said spring oscillation system is equal to a resonance frequency of said linear oscillator or a frequency in a vicinity thereof.
3. The linear oscillator according to Claim 1, wherein said moving part and said amplitude control spindle reciprocate at a resonance frequency moving in respective phases opposite to each other.
4. The linear oscillator according to Claim 2, wherein said electromagnetic driving part includes a coil to thereby use a coil current, thus enabling controlling a reciprocating motion.

5. The linear oscillator according to Claim 1, wherein a shaft for taking out a motion output is connected as a connection element to said moving part or said amplitude control spindle.

6. The linear oscillator according to Claim 1, wherein said amplitude control spindle is provided with rocking preventing means for preventing rocking.

7. The linear oscillator according to Claim 2, wherein:

said spring member is formed of a coil spring; and

mass of said amplitude control spindle and a connection element thereof is larger than mass of said moving part and a connection element thereof.

8. The linear oscillator according to Claim 5, wherein said shaft is partially or entirely made of a nonmagnetic substance.

9. The linear oscillator according to Claim 8, wherein only a piercing portion of said moving part passing through said shaft is made of a nonmagnetic substance.

10. The linear oscillator according to Claim 5, wherein revolution restricting means is provided for restricting axial revolution of said shaft.

11. The linear oscillator according to Claim 10, wherein said spring member operates as said revolution restricting means.

EXPLANATION OF REFERENCE NUMERALS

1 plunger,

5 coil,

7 shaft,

9 amplitude control spindle, and

10 shield case.